Environmental Sampling Procedures

Responsible Official: Mark D. Sells Date: 3/3/2011

Technical Review: _____ Date: 3/3/2011
Technical Expert (Reviewer)

Approved By: Mark D. Sells Date: 3/3/2011
CERMER QA Coordinator

Approved By: _____ Date: 3/3/2011
CERMER Director

Approved By: Alejandra N. Baez Date: 3/15/2011
R&IE Quality Assurance Manager

Approved By: _____ Date: 4 MARCH 2011
R&IE Director

BIENNIAL REVIEW

Review Due:	03Mar2013	Reviewed By:		Date:	
Review Due:		Reviewed By:		Date:	
Review Due:		Reviewed By:		Date:	

SOP REVISIONS

Rev. No.	Rev. Date	Revision	Responsible Official
00	13Jul2004	Original Issue	H. Diaz
01	03Mar2010	Reformat to RIE-101 R5 conventions, Revisions to sampling methods and handling/packaging, addition of Chain-of-Custody Procedures	M. Sells

This page intentionally left blank

TABLE OF CONTENTS

This page intentionally left blank

1.0 PURPOSE

This Standard Operating Procedure (SOP) describes the processes related to the collection of samples in the environment, including but not limited to air, soil, water, wipes, or other samples that may be related to radiation exposure and/or ingestion pathways in humans. This version of CER-220, Revision 1, replaces CER-220, Revision 0.

2.0 SCOPE AND APPLICATION

2.1 Scope and Application

This SOP establishes the methods and requirements for collecting, packaging, handling, transport, and delivery of environmental samples. The sampling procedures are not site specific which make them available for use in emergency response activities and other projects. The procedures described here apply to the collection of environmental samples to be analyzed for radionuclides using both non-destructive and destructive analytical processes.

2.2 Interferences

N/A

2.3 Potential Problems

Consider all environmental sampling locations to be contaminated and proceed accordingly.

3.0 DEFINITIONS

ALARA	As Low As Reasonably Achievable
CERMER	Center for Environmental Restoration, Monitoring, and Emergency Response
Contamination	The presence of unwanted material making an area unsuited for the purpose of which it is intended
CRQA	Center for Radioanalysis and Quality Assurance
Cubitainer	A collapsible polyethylene bottle used to transport liquid samples, typically of one quart or one gallon volume
Decontamination	The removal or reduction of unwanted material from a place, item, or person
Deposition	The accumulation of (radioactive) material on unprotected surfaces from accidental release
FML	Field Monitoring Log
FRMAC	Federal Radiological Monitoring and Assessment Center

Grab Sample	A single sample that is intended to represent the composition of the source at the time and place where that sample is collected
Green Chop	Grass, legumes, or plants that are chopped and fed green to livestock
HASP	Health and Safety Plan
Hay	Grass, legume, or plant that has been cured or dried for use as feed for livestock
QA/QC/QAC	Quality Assurance/Quality Control/Quality Assurance Coordinator
QAPP	Quality Assurance Project Plan
RERT	Radiological Emergency Response Team
SAP	Sampling and Analysis Plan
Sediment	A collection of small particles that settle or precipitate from a body of water
SOP	Standard Operating Procedure
USDA	United States Department of Agriculture

4.0 PERSONNEL

All personnel assigned to collect environmental samples are expected to work independently of direct supervision and must possess an understanding of the procedures in this SOP in addition to the qualifications listed here.

4.1 PERSONNEL QUALIFICATIONS

4.1.1 All new field personnel will be provided with training courses in environmental sampling involving the media types discussed in this SOP. Documentation of formal training shall be maintained by the R&IE Training Coordinator. If training courses are not readily available, all new personnel will learn and perform these procedures under the direct supervision of an experienced field sampling technical expert. Form RIE101-004F "Worker On The Job Training (OJT) Qualification Form" shall be used to document on the job training and copies of the form presented to the Center Quality Assurance Coordinator (QAC) for archive.

4.1.2 All experienced personnel will provide management with certificates from courses specific to environmental sampling or provide project specific work experience. In addition, they will be provided with refresher courses in environmental sampling biennially or when procedures are modified or changed.

4.1.3 Personnel who perform this procedure must be familiar with applicable field and laboratory procedures in the handling and use of hazardous and/or radioactive materials.

4.1.4 Field personnel must be familiar with the procedures included in this SOP for collecting environmental samples.

4.1.5 Field personnel must be familiar with decontamination (decon) procedures, and the methods used to avoid cross contamination of samples.

4.2 PERSONNEL RESPONSIBILITIES

4.2.1 The Field Team Supervisor and Monitoring Manager, or organizational equivalents, shall ensure that field teams assigned to collect samples in a potentially contaminated area have access to information about the areas of deposition of radioactive materials so that teams can avoid passing through known areas of contamination and therefore avoiding unnecessary exposure.

4.2.2 All personnel who collect environmental samples are responsible for following the requirements put forth in the Health and Safety Plan (HASP) for the project or incident. Each person must follow ALARA principles and be aware of exposure and dose turn back levels set for the project.

4.2.3 All personnel who collect environmental samples are responsible for following the procedures and QA requirements described within this SOP and to be aware of and comply with site specific regulations and QA protocols as defined by organizational management and/or the project Quality Assurance Project Plan (QAPP) or other environmental sampling plan.

4.2.4 All personnel who collect samples using this procedure are responsible for completing all documentation associated with the sample, and ensuring that all forms are complete and correct prior to transfer of the sample out of their custody.

5.0 EQUIPMENT AND SUPPLIES

5.1 Standard Equipment and Supplies

- Adhesive tape
- Alert labels
- Bottle or cubitainer of clean water (minimum of one gallon)
- Clipboard
- Disposable gloves
- Forms (Sample Control Forms, Field Monitoring Logs, Chain-of-Custody Forms)
- GPS Receiver (DD.ddddd display format capability)
- Indelible-ink marking pens and markers
- Sealable plastic bags, various sizes
- Large sample bags (18" x 24")

- Scissors or knife
- Lead shielded storage box (as needed)
- Survey instruments
- Field Notebook
- Trash receptacle/bags

5.2 Air sampling supplies

Refer to the following SOPs:

- CER-205 R1, "Operation of Low Volume Air Samplers", Center for Environmental Remediation, Monitoring, and Emergency Response, Mar2011
- CER-206 R0, "Operation of the DL-28B Low Volume Air Sampler" Center for Environmental Remediation, Monitoring, and Emergency Response, Draft
- CER-207 R0, "Operation of the DH-504/804 High Volume Air Sampler", Center for Environmental Remediation, Monitoring, and Emergency Response, Draft

5.3 Water sampling supplies

- Absorbent towels
- Bucket/Collection container
- Bucket, Large 5-gallon (~20 liters)
- Cubitainers, 1 gallon or 1 quart (1 liter)
- Plastic funnel
- Rope
- Waterproof gloves

5.4 Soil sampling supplies

- Cardboard box (for carrying/storing tools or samples)
- Clean tub (for decon/washing tools)
- Flat trowel
- Hammer
- Sampling frame, 10 x 10 cm (See Diagram, Appendix 17.1)
- Steel Scoop/Large Spoon
- Sealable bags, 1 qt.
- Tape measure
- "Texberry" glass jars with lids, 16 oz., or equivalent
- Work gloves

5.5 Vegetation (Crop or Animal Feed) sampling supplies

- Hammer
- Knife
- Shears/ vegetation cutters
- Shovel
- Tape measure
- Work gloves

5.6 Milk sampling supplies

- Cubitainers
- Ice or Dry Ice
- Ice chest
- Preservative (Formaldehyde), as instructed

5.7 Special Sampling supplies as needed

- Preservatives, only when required (Nitric Acid, Hydrochloric Acid or Formalin)
- Graduated Cylinder, at least 1 liter (~1 quart) for rain measurement
- Plastic Sheet, rope, tent stakes and cord or light gauge rope (Rain collection)
- Computer or Electronic Tablet with Electronic Forms (FRMAC Data Center)
- Decon water supply for decontamination of sample tools and equipment or containers.

6.0 REAGENTS AND STANDARDS

N/A

7.0 HEALTH AND SAFETY

7.1 Health Cautions

7.1.1 A tailgate briefing will be conducted and documented by the Field Monitoring Manager or designee each day prior to performing sample collection or monitoring activities.

- The briefing will include all health and safety issues that are addressed in the Health and Safety Plan (HASP) for the event/project.
- All personnel attending the briefing will sign the appropriate attendance form.
- A copy of the HASP will be made available to all personnel at their request.

7.1.2 Always wear all Personal Protective Equipment (PPE) as required by the HASP or other H&S site or project specific requirements during field monitoring and sampling operations.

7.1.3 Material Safety Data Sheets (MSDS) are required to be located in the sampling vehicle when using hazardous materials to treat or preserve environmental samples.

- Use caution when handling acids or formaldehyde as preservatives. Eye protection and appropriate gloves are required.
- An eyewash bottle or station must be within six feet and at the same level as the area where acids or chemicals are being used. This location must be known by all personnel, who shall be instructed in its proper operation.
- Chemicals used to treat samples in the field should be used only in well-ventilated spaces.

7.1.4 Special handling may be required for samples with radioactivity greater than background.

- Any samples that have gamma exposure rates above 1 mR/hr at one foot should be stored in a shielded container in the field team vehicle.
- If sample exposure rates are greater than 2 mR/hr at one foot, contact the RSO or the Field Team Supervisor for further instructions regarding handling of the sample.
- All attempts should be made to protect the vehicle occupants from exposure using ALARA principles.
  - Shield occupants by covering hot samples with other samples or items to act as shielding.
  - Place the samples as far from the occupants as possible in the vehicle.
  - Transport and process the samples as quickly as possible to reduce any exposure time to the occupants of the vehicle.
- Always inform personnel accepting transfer of samples (sample control or courier for example) of samples with elevated levels of radioactivity or contamination.

7.2 Equipment Cautions

Environmental sampling requires the use of several types of sharps/cutters/knives for collection of soil, vegetation and foodstuffs. Always use caution and proper procedures when cutting or sampling materials using these objects.

8.0 SAMPLE COLLECTION, PRESERVATION, AND STORAGE

8.1 Samples collected for radioanalysis normally will not require any preservatives to be added in the field. In most cases, samples will be preserved during the sample preparation stage. In some atypical situations, there may be a specific requirement for preservation in the field. Those situations may include but are not limited to the following:

- In the event preservatives are required to be added in the field, supplies and instructions will be provided to the field team as coordinated by the Field Monitoring Manager or Environmental Unit Leader.

- Milk samples that may not be processed for some time after collection may require the addition of Formaldehyde or Sodium Bisulfite to prevent spoilage. Usually, only samples stored at excessive temperatures or for more than 24 hours prior to processing would require preservation in the field.

- Water samples that may contain radionuclides that have a potential of plating on the interior of the sample container may require early addition of nitric acid. Normally the addition of the acid at a later time will cause resuspension of the analyte, obviating the need for addition of acid in the field.

8.2 Always use protective eyewear and gloves when handling preservatives.

8.3 Always clearly mark the sample container after addition of preservatives to identify that hazardous chemicals have been added.

8.4 It is the responsibility of Sample Control to assure that samples are properly stored and preserved upon delivery from the field.

9.0 CALIBRATION AND STANDARDIZATION

9.1 All radiation survey meters shall be checked on a daily basis prior to first use and after the last use to make sure they are operating within expected parameters.

9.2 All radiation survey meters shall have been calibrated within the previous 12 months. Calibration documentation shall be included with each meter or kit, and each meter shall carry a label with the calibration information.

10.0 PROCEDURE

All samples collected using this procedure will be based on standard Federal Radiological Monitoring and Assessment Center (FRMAC) or Radiological Emergency Response Team (RERT) sample sizes unless modified as part of the Data Quality Objectives (DQO) process established by the laboratory and incident management to assure that the required detection limits are met. The standard sample collection sizes are as follows:

- Default air sample flow rates and run times are 40 CFM for 24 hours for a 4" Hi-Volume air sample, and 2 - 3 CFM for 1 week (168) hours for a 2" Low-Volume air sample. Special circumstances may apply when Hi-Volume samplers are used with a 2" filter.

- Water samples are collected into a one-gallon cubitainer for standard gamma or gross alpha/beta analysis. Water samples collected for Tritium analyses are collected into one-quart glass bottles filled to the top, with a Teflon lined cap to prevent entrainment of air in the sample.

- Soil samples are collected using FRMAC/RERT soil sampling tools to collect a 10 cm. x 10 cm. (100 cm^2) sample that is 2 – 3 cm. deep. The sample is collected into a glass sample jar (Texberry brand, 500 cc) or other approved analysis geometry. This type of soil sample is used to estimate the amount of radiological deposition per 100 cm^2.

- Vegetation, animal feed, human foodstuffs – approximately 2.2 lbs. (1 Kg.) will be collected into a large sample bag.

- Milk samples – One gallon of milk is collected into a one-gallon cubitainer.

10.1 Chain-of-Custody

The Chain-of-Custody Record shall be used to record the possession of and to list all transfers of each sample by signature. This piece of documentary evidence attests that the sample was constantly under custody from the time of collection to the time of surrender to the laboratory. The Chain-of-Custody Record will be reviewed and signed by each person at the time of any change of custody.

The Chain-of-Custody form (See example, appendix 17.5) can be used to maintain custody of more than one sample at a time. Up to fifteen samples can be recorded on one form, one per line as well as up to six separate sample types, identified by the diagonal lines on the form. Custody of the samples must be maintained and transferred as a group in this situation.

Some environmental samples collected during emergency response activities may be transferred by mail to a fixed laboratory facility. Signature custody is to be maintained until transfer is made to the postal carrier or shipper, and the person who accepts custody upon delivery to the laboratory shall sign receipt and continue to maintain custody records as described by this procedure. If there is a potential that sample results may be used in litigation, it is recommended that registered or certified mail be used.

A sample and its documentation are under custody (per this procedure) when:

- ✓ it is in your possession, or
- ✓ it is in your view, after being in your possession, or
- ✓ it was in your possession and
- ✓ it is placed in a designated secure area.

10.1.1 Chain-of-Custody for Grab Sampling

- A Chain-of-Custody Form will be initiated at the time of collection of any grab sample (re: soil, water or vegetation sample, etc.) by the person who collects the sample.

- Complete the form in its entirety according to section 10.1.3 of this procedure.

- Keep the sample and the Chain-of-Custody Form together until the time of surrender to Sample Control, recording all transfers of custody in the appropriate signature blocks.

10.1.2 Chain-of-Custody for Composite Sampling

- A Chain-of-Custody form will be initiated at the time a composite sample (re: week-long air sample, tritium or noble gas sample, etc.) is started. Keep the form in a secured location (generally placed in a holder inside air sampler housing) at the sampling site until the sample is collected or in a temporary field file held by the person who will collect the sample at its completion.

- Initiate the Chain-of-Custody form by filling in all information about the sample except for the collection date and time. Include the sampler's signature in the appropriate block and annotate the start date and time for the sample in the remarks section of the form.

- When the composite sample is completed and collected, the remaining portions of the form are to be completed. Record the sample collection date and time in the appropriate blocks. Record the signature of the person collecting the sample in the Samplers Signature block next to the signature of the person who started the sample (see also10.1.3).

- Keep the sample and the Chain-of-Custody together until the time of surrender to Sample Control, CRQA, recording all transfers of custody in the appropriate signature blocks.

NOTE: Composites of sample types other than standard air samples will be collected as individual samples and the composite will be prepared by the sample preparation facility for lab analysis, unless otherwise instructed by Monitoring Management.

10.1.3 Completion of Chain-of-Custody Forms

Use only official Chain-of-Custody forms (See example, attachment 17.5). These forms are carbonless and shall be completed using a ball point pen with indelible black ink. Complete the forms with the following information.

- **PROJECT NO.** - Record the established project number assigned to the sample project or event.

- **PROJECT NAME** - Record the appropriate project name for the sample project or event.

- **SAMPLERS: (*Signature*)** - The signature of the person who initiates the Chain-of-Custody form (the same person to initiate and complete the sample). If a different person collects the sample than the person who initiated the sample, both of the sampler's signatures are to be entered in this block, separated by a slash (/).

- **STA. NO.** - Record the station number of the location where the sample is collected, if appropriate.

- **DATE** - Record the date that the sample is collected. All dates should be recorded in the format established for the project.

- **TIME** - Record the time that the sample is collected in 24 hour clock format (Example: 1530).

- **COMP/GRAB** - Place an X in the box that describes the sample type (grab sample or composite/continuous sample)

- **STATION LOCATION** - Enter the name of the station or a description of the sample location and the Lat/Long coordinates if applicable.

- **NO. OF CONTAINERS** - Enter the number of containers that contain the sample referenced by this line on the Chain-of-Custody form.

- **Diagonal Lines** - Identify the sample type(s) in this area as well as the number of this type of sample contained within each unique sample container (Example: prefilter, charcoal cartridge, milk sample, etc.).

- **REMARKS** - Enter any comments regarding the sample, including start date and time for composite samples, container type or information about conditions at the time of sample collection.

- **Signature Blocks** - All sample custody transfers must be recorded here.

10.1.4 Transfer of sample custody

- Transfer of sample custody must be annotated within the signature blocks on the Chain-of-Custody form.

- All sample transfers are recorded in one Relinquished by/Received by block.

- The person that relinquishes the sample signs the form in the appropriate block at the bottom of the form. The person that receives the sample enters the date and time of the transfer and then signs the form in the appropriate block.

- The final sample transfer to the laboratory is recorded in the "Received for Lab. by" signature block at the bottom of the form.

10.2 Sample Control Form (SCF)

The Sample Control Form (See example, attachment 17.3 and 17.4) is a document used for recording sample collection information for environmental samples. The SCF can come in different formats and styles but will always contain all of the vital parameters for the samples being collected, and areas where additional specific sample collection information can be recorded.

The RERT SCF is divided into four main sections, including general sample information, specific sample information segregated by sample media type, sample collection information with radiation exposure measurements, and a remarks section with a Quality Control identifier. The RERT SCF also includes a specific area for use by Sample Control for analysis request information and special comments.

The RERT SCF is similar in format and style to the FRMAC SCF. This section applies to the use of any Sample Control Form which could potentially be used to record information for the types of samples described in this SOP. This section refers to the RERT SCF and may require basic modification if another style of SCF is used.

10.2.1 Complete a Sample Control Form for all samples collected in the field. Each SCF must have a unique sample number, identified in the upper right corner of the form. Each SCF also has at least two barcode labels reflecting the SCF number attached.

10.2.2 Complete the top section of the SCF with team information, sample location and sample type. Describe the location of the sample with enough detail that a different person or team will be able to locate the exact position where the sample has been collected.

10.2.3 Annotate the middle section of the form with specific sampler information based on the sample type found in the subsections of this part of the form. Each subsection contains locations for the information needed for each specific sample type. Only one of the subsections should be completed, as there is only one SCF generated per sample.

10.2.4 Some air samples consist of two parts, a particulate filter and charcoal or zeolite cartridge. The SCF for air samples is initiated when the sample is started, and completed when the sample is collected. Separate SCFs should be created for each part, with cross-reference information included on the form.

10.2.5 Finish filling the remaining section of the form as appropriate upon completion of the sample which would be the end of the sample period for air samples, or upon completion of the packaging for grab samples. Include information about the time/date of collection and any information about the sample size, number of packages, and contact beta/gamma radiation levels.

10.2.6 Annotate the form with any additional information or comments in the remarks area provided, and reference the sample number of any associated quality control samples that are associated with the sample. If a Field Monitoring Log is being kept, annotate the sample number in the appropriate section of the form for the specific area being sampled.

10.3 Air Sampling

For the collection of air samples for particulate radiation, Refer to the appropriate procedure:

- SOP CER-205, "Operation of Air Samplers without Flow Measurement"
- SOP CER-206, "Operation of DL-28 series air samplers"
- SOP CER-207, "Operation of DH-504 series air samplers"

10.4 Water Sampling

Water samples must be representative of the body of water to be analyzed. If sampling in strong rain, wind, hail, etc. the body of water may become churned up to a point where material from the sedimentary layers becomes suspended. This material can bias the "true" activity concentrations of the various radionuclides dissolved or suspended in the sample. Choose a location with minimal turbidity and that contains little or no organic material or debris.

Prior to collecting any outdoor samples, survey the general area for contamination, recording the results on the Field Monitoring Log for the location being sampled.

10.4.1 Water Sampling of municipal supplies or private wells

- Prepare to take a sample.
    - Select a sample point (faucet or tap) where a sample that is representative of the water supply can be obtained.
    - On a Sample Control Form, record the GPS reading, location, time, date, and other information. Include a description of the well (depth, if known; capped, etc.).
    - Use a bar code label or indelible ink pen to record the sample control number on the sample collection container.
- Turn on the pump if necessary, and/or open the faucet. Let it run approximately one minute for shallow wells (less than 40 feet) or municipal water supplies, and five minutes for deep wells (greater than forty feet). This will flush the water lines and provide a representative sample from the source.
- Using a clean funnel, if necessary, put small amounts of sample water into the sample container. Cap and shake the container to pre-rinse, and discard water. Rinse the cap also.
- Fill the sample container. Approximately 3.5 liters (1 gallon) is typical for gamma analysis. If there is a problem with water availability, 1 quart (1 liter) is the minimum amount needed for gamma analysis. Remove the funnel, add preservative (Nitric Acid, 35 mL) if instructed to do so, and cap the container. Use one-quart glass bottles

with a PTFE lined cap for tritium samples, filling the bottle completely and capping it so that no air is entrained in the bottle. Tritium samples do not require acidification.

- Turn off the faucet (or pump if needed).
- Decontaminate the funnel with clean water and place it in a plastic bag.
- Dry the exterior of the sample container with an absorbent towel.
- Package and label the sample according to Section 10.9.

10.4.2 Surface Water Sampling

- Prepare to take a sample.
    - Select a location that will provide adequate sample volume from an undisturbed or naturally flowing area of the pond/lake/stream that is being sampled. Stand clear of bridges or structures that may disturb the natural flow of the stream or very shallow areas where sediments or aquatic vegetation is easily disturbed.
    - Record the GPS reading, location, time, date, and other descriptive information on the SCF.
    - Use a bar code label or indelible ink pen to record the sample control number on the collection container.
    - If the funnel and bucket have been previously used, they should be cleaned and surveyed prior to reuse.
- Set the sample container in a stable location on the ground with the funnel inserted in the opening.
- Lower the bucket into the main channel of stream, disturbing sediments and aquatic vegetation as little as possible. Use this initial grab to rinse the collection bucket and sample container prior to collection of the sample.
- Collect at least one gallon of sample into the bucket and pour it into the sample container until the water is within ~1 inch (2 cm.) of the top. If water availability is a problem, 1 quart (1 liter) is the minimum amount of sample needed for gamma analysis. Add preservative (Nitric Acid, 35 mL) if instructed to do so, and cap the container. Use one-quart glass bottles for tritium samples, filling the bottle completely and capping it so that no air is entrained in the bottle. Tritium samples do not require acidification.
- Rinse the funnel and bucket with clean water.

- Dry the container with an absorbent towel.
- Package and label the sample according to Section 10.9.

10.4.3 Rainwater Sampling

- Choose an area that is open, not sheltered by buildings, trees, or high brush, when possible.
- Assemble a rain collection system at the desired location. Find a location where leaves or other debris cannot blow into it and clog the drain. In addition, make sure the collection system is anchored securely so high winds will not overturn it. Be aware that samples may have to be collected in freezing or near-freezing conditions.
- Building a Makeshift Rain Collection system
    - Cut a plastic sheet to the predetermined size. Tie each corner to the stake that will hold it 5-8 cm (~2-3 inches) above a 5-gallon bucket when the stakes are driven into the ground and the plastic is stretched out like a canopy.
    - Cut a small slit in the center of the plastic and center the bucket under the hole.
    - Place the weight over the slit. The weight provides slight downward slant to the plastic. The rain will run into the bucket.
    - Note: This system will not stand up well to heavy rain, wind, or snow, but in an emergency it is simple to set up and move.
    - Annotate the Sample Control Form with the date and time when the rain collection system was set up, and the total area of the collector.
- When returning to collect the rain sample, survey with a beta/gamma survey instrument, if applicable.
- Prepare to take a sample.
    - Record the GPS reading, location, time, date, and other descriptive information on the SCF.
    - Use a bar code label or indelible ink pen to record the sample control number on the collection container.
- Measure the precipitation.
    - Transfer the rain water to a graduated cylinder or measuring cup or other volumetric measuring device.

- If the water cannot be transferred directly to a measuring device, pour the rain water into a clean bucket and then transfer it to a measuring device. Record the volume on the SCF.

- Collect the sample.

  - Using a clean funnel if needed, put a small amount of sample water into the sample container and replace the cap. Swirl or shake the bottle and then discard the rinsate and repeat the process at least one time. Try not to wet the outside of the sample container.

- Carefully fill the sample container. Approximately 3.5 liters (1 gallon) is typical for gamma analysis. If a full gallon is not available, 1 quart (1 liter) is the minimum amount needed for gamma analysis. Remove the funnel, add preservative (Nitric Acid, 35 mL) if instructed to do so, and cap the container. Use one-quart glass bottles for tritium samples, filling the bottle completely and capping it so that no air is entrained in the bottle. Tritium samples do not require acidification.

- Rinse and decontaminate rainwater collection system with clean water before leaving. Include both catch basin and rain collection jug.

- Dry container with absorbent towel.

- Package and label the sample according to Section 10.9.

- Note date and time on new form if additional samples are to be collected.

10.5 Soil Sampling

In the early phase of an emergency, soil is collected for the purpose of surface contamination (deposition) monitoring. The most important variable is the surface area of the sample. The depth of the sample is also important, as all activity is deposited on the surface of the soil and unnecessary depth will dilute the sample results. This entire section should be reviewed and portions modified to fit the type of soil to be sampled using site specific quality assurance protocols.

In order to collect a representative soil sample, choose soil that is relatively dry, except for sediment, and is in a flat, open area. Do not sample under trees, bushes, or other overhanging objects. Avoid windrows or areas next to roads or buildings. If area to be sampled is covered with vegetation, leaves, etc., treat that portion as a separate vegetation sample.

10.5.1 Ground Deposition

- Prepare to take a sample.

  - Place all sampling tools into a plastic bag or box for carrying.

- To avoid contamination, place a plastic bag or sheet on the ground; lay the clipboard, instruments, and tools on the plastic.
- Record the location, lat-long., time, date, and other descriptive information in the appropriate areas on the SCF.
- Put on work gloves over disposable gloves.
- Survey the site using an appropriate survey meter, taking readings at approximately 1 meter (3 feet) and at 2.5 cm (1 inch) above ground. Record the readings on a Field Monitoring Log (FML, see example, attachment 17.2).
- Use a bar code label or indelible ink pen to record the sample control number on the selected sample container.

- Be careful not to disturb the sample collection area while digging the trench.
- Using a trowel, dig a trench approximately 45 cm long x 15 cm wide x 15 cm deep (18 in x 6 in x 6 in). Fashion a vertical surface that is as straight as possible, (see diagram, appendix 17.1).
- Place the open end of the sampling frame (see diagram, appendix 17.1) against the edge of the trench to form a 10 cm x 10 cm (4 in x 4 in) square sample area. Press or tap (if hard) the cutter edge into soil to stops (2 cm deep).
- Slide the flat trowel under the sample frame, pick up the sample, and slowly dump it into a 16-oz glass low profile jar or other approved sample geometry. Check that the sample control number is on the container.
- Record the depth of the sample the SCF.
- Clean the sampling equipment with decon (clean) water.
- Package and label the sample according to Section 10.9.

10.5.2 Wet Soil Sampling

- If rain and water saturation make it impossible to dig next to the collection area, attempt to remove the surface layer of the collection area with a scoop, while carefully determining the area of the sample collected.
- If snow has fallen since the suspected time of deposition, gently remove as much snow as possible from the collection area without disturbing the soil surface and take the sample. In the event that the snow cannot be removed without disturbing the soil surface, collect the snow with the sample.

- If snow fell before deposition occurred, sample the snow then take a soil sample as two separate samples. If there is not enough snow to constitute a separate sample, sample the snow and soil together as one sample. Annotate the remarks section of the SCF as appropriate. If two samples are collected, record the sample control number of the co-located sample on each Sample Control Form.

10.5.3 Dry Soil Sampling

- Unconsolidated or sandy soil that is extremely dry and loose should be sampled carefully without digging a trench next to the area. From a known (measured) area, collect the soil by carefully lifting the surface area off the measured plot using the scoop or a spoon.

10.5.4 Soil with Vegetation Sampling

- Mark the exact area to be sampled and collect two samples with separate Sample Control Forms.
    - Sample 1: Remove and collect all ground cover vegetation, cutting as much vegetation as possible, with minimal disturbance of soil.
    - Sample 2: Collect the soil sample, including root mass if vegetation is grass.
- Cross-reference sample control numbers of these co-collected samples on the opposite SCF.

10.5.5 Sediment Sampling

- Prepare to take the sample.
    - Place all sampling tools (scoops or sediment traps) and the Sample Control Form into a plastic bag for carrying.
    - To avoid contamination, place a plastic sheet or bag on the ground; lay the clipboard, instruments, and tools on the plastic.
    - On the Sample Control Form, record the GPS reading, location, time, date, and other descriptive information.
    - Use a bar code label or indelible ink pen to record the sample control number on the collection container.
- Put on work gloves over disposable gloves.
- Use the sediment sampling device (scoop or sediment trap) to collect the sample.

- Retrieve the sediment sampling device and lower it into a plastic bag.
- Open the sediment sampling device to deposit sediment into the bag.
- Using a scoop, remove at least 1 liter (~1 quart) of sediment into pre-labeled large sample bag.
- Rinse the sampling gear thoroughly.
- Package and label the samples according to section 10.9

10.6 Human Food Sampling

10.6.1 The purpose of human food sampling is to measure deposition as well as plant uptake. Collect the green or leafy portions from the same type plant to complete the sample. Collect the edible portions of the plant, not the roots or stems, unless otherwise directed. In some cases, the root or tuber may be the edible part of the plant, and will constitute the main part of the sample.

10.6.2 Samples may be selected directly from plants in the field or garden or from crates after they have been harvested. A notation should be made on the condition of the sample and the growth or harvest stage of the plant.

10.6.3 Select a location for a grab sample or mark grid locations. Use of mechanical harvesters is encouraged to collect samples when practical. Manual collection of enough wheat or rice, for example, to make an appropriate size sample might be too time consuming.

10.6.4 In a field or garden, collect the sample from an area unprotected from the wind whenever possible; i.e., away from trees, structures, etc.

10.6.5 Collect at least 1 kilogram (~ 2.2 pounds) and note dimensions or area collected (i.e., for surface vegetation) on the SCF.

10.6.6 Prepare to take sample.

- Place all sampling tools into a plastic bag for carrying.
- To avoid contamination, place plastic bags on the ground and lay the clipboard, instruments, and tools on the bags.
- On a Sample Control Form record the GPS reading, time, date, and other descriptive information. Note the grid area or approximate location from which the sample was taken.
- Survey the site using an appropriate survey meter, taking readings approximately at 1 meter (3 feet) and at 2.5 cm (1 inch) above ground. Record all reading on the FML.

10.6.7 Use bar code label or indelible ink pen to record sample control number on sample collection container.

10.6.8 Put on work gloves over disposable gloves.

10.6.9 Package and label the sample according to Section 10.9.

10.7 Milk Sampling

For a variety of reasons, milk samples are very important in a radiological emergency. Timely sample collection and assay is required. Samples will normally be taken from receiving and transfer stations, processing plants, and individual dairy farms. Most dairies store milk in bulk tanks and must be sampled by dairy personnel according to plant procedures to avoid contamination of the milk, usually in the presence of an appropriate Federal or State official.

If possible, when raw milk is sampled, the sample should be taken from cows that have been grazing in the area of interest, not fed from stored feed. In addition to milk samples, it is important to collect samples of the hay, grass, feed, and water being consumed by the animals, and annotating the appropriate information and cross references on the SCF.

10.7.1 Commercial Dairy Sampling

- Telephone ahead to arrange for the collection of the milk and to assure that the needed volume will be available and that scheduling with appropriate authority can be made.
- Present sample containers to the primary contact at the dairy. Primary contact at dairies or processors may be an office employee, herdsman, or other employee with signature authority. The presence of an official from State or Local Government or the USDA may be required prior to sampling.
- To prevent contamination of collected milk, use only thoroughly clean sample containers during transit and handling.
- Collect one sample of at least 1 gallon (3.8 liters).
- Collect raw or whole milk (cream mixed into the milk) whenever possible.
- Add preservative to milk sample, as instructed.
- Mark the milk samples or place a bar code label on container, and transport them to the laboratory as soon as possible.
- During hot weather, transport milk samples in an ice chest.
- Package and label the sample according to Section 10.9.

10.7.2 Small Farm Sampling

- Make every effort to contact the farm owner prior to arrival to assure that adequate sample will be available and that your visit will not interfere with farm activities.

- Pre-arrange for payment to the owner for purchase of the milk through the Incident Command System (ICS) Planning and Finance sections or the appropriate organizational management for an agreed upon price for the milk, if needed. Payment of up to 4 or 5 times the market value for the milk may be required to obtain the sample. A payment voucher or receipt may be required.

- Typically, family milk cow owners milk in the morning and in the evening. It is likely that the owner will hold the specified amount of milk for you to pick up. If the sample must be collected at the time of milking, special arrangements must be made at the discretion of the farmer.

- Fill the sample container with milk. Add preservative as instructed.

- Complete a Sample Control Form with the name and location of the farm, date and time of milking, volume, typical milking schedule, type of feed, water source, and collector's initials.

- Rinse all devices used in the sample collection with clean water.

- Prepare and label the sample according to Section 10.9.

- Place packaged sample in an ice cooler for transport.

10.8 Animal Feed Sampling

Animal feed samples are collected to determine the impact of contamination that may be consumed by farm animals and therefore entering the human ingestion pathway.

10.8.1 Collect samples that are representative of what is being eaten by the animals. For open pasture, select areas that are openly exposed to deposition (i.e., away from trees, structures, etc.), and easily sampled (i.e., free of rocks, trees, and other interference). The sampling area should have relatively uniform distribution of vegetation that covers the ground.

10.8.2 Collect the green or leafy portions of the plant, not roots and stems. Avoid collecting weeds.

10.8.3 Collect samples of each type of feed from those portions of the sample which have the most potential for exposure from the contamination event.

Type	Amount to Collect
Granular or Cubed feed	Equivalent of one cubitainer of granular feed; one 16- x 24- inch plastic bag full of cubed feed
Hay, Green Chop, Silage Grain, Pasture	One 16- x 24- inch plastic bag full or equivalent of one cubitainer full but a minimum of one kilogram (2.2 pounds)

Prepare to take pasture samples as follows:

- Place all sampling tools into a box or plastic bag for carrying.
- To avoid contamination, place plastic sheeting on the ground and lay the clipboard, instruments, and tools on the bags.
- Survey the site using an appropriate survey meter, taking readings approximately at 1 meter (3 feet) and at 2.5 cm (1 inch) above ground. Record all readings on the FML.
- On a Sample Control Form record the GPS reading, time, date, and other descriptive information. If necessary, diagram the sample location in the event additional samples need to be collected from the same location. Attach diagrams or special notes to the FML.
- Use an indelible ink pen to label the collection container with the sample control number, or a place a bar code label from the SCF on the container.
- Put on work gloves over disposable gloves.

10.8.4 Bag enough material to satisfy laboratory sample volume requirements. Do not add additional leaves, stems, or other parts not considered edible. Cut vegetation no closer than 1 cm (0.5 inch) to avoid contaminating the sample with soil. Note the dimensions of the area collected on the SCF.

10.8.5 Rinse any tools used in sample collection with clean water and survey them for contamination before reuse.

10.8.6 Package and label the sample according to Section 10.9.

10.9 Sample Packaging and Labeling

After completion of the collection and documentation of a sample, complete the following instruction to prepare the sample for transport to Sample Control.

10.9.1 Determine if the primary packaging of the sample is contaminated by collecting a wipe sample directly from the outside of the package and monitor the wipe for α/β/γ as appropriate.

> Avoid cross-contamination. Wear disposable gloves and change gloves frequently whenever contamination is suspected.

10.9.2 Place the primary sample container into a sealable plastic bag. If removable contamination is present, use care to avoid the spread of contamination to the outside of the second bag. Annotate the SCF with the contamination information.

10.9.3 Determine β/γ contact exposure rates from the sample and record the result on the SCF. If the result is greater than 5 times background for Beta or Gamma, write the value on the outside of the package containing the sample.

> During transit, ensure that samples with exposure rates greater than background are segregated and shielded as much as possible from personnel and stored dosimeters. Maintain ALARA principles.

10.9.4 Write the sample number from the SCF on the outside of the sample package.

10.9.5 Review the SCF for completeness and accuracy. Record any additional information about the sample in the remarks/comments section of the SCF. Make sure that exposure and contamination information is included.

10.9.6 Place the sample primary package along with the original copy of the SCF into a new plastic sample bag. Assure that SCF information is visible through the packaging.

10.9.7 Fill out and attach security seal and priority labels as required.

10.9.8 Annotate the FML and the Chain-of-Custody form with information regarding the sample. Reference the sample number from the SCF in the remarks section of both forms.

10.9.9 Maintain all forms not included in the sample package separately and where they can be kept clean and free from contamination. Use a separate sealable bag if needed.

> Ensure that proper Chain-of-Custody procedures are followed at all times during sample transit. Refer to section 10.1 of this procedure.

11.0 QUALITY ASSURANCE

11.1 Quality Control

11.1.1 Duplicate samples

- Duplicate samples shall be collected at the direction of the project Quality Assurance or Management Staff or the SAP/QAPP and submitted to the lab following the sampling procedures outlined in this document using a second, co-located sampler.
- The number of duplicate samples that are collected may vary in an emergency, with the long term goal of 20% of the samples collected as QA samples.
- For long term sampling projects, duplicate samplers should be co-located with a routine sampler for a minimum of one calendar quarter (three months).
- Locations that are expected to have samples above the MDC of the analyte of interest, should be given priority consideration in the placement of duplicate samplers, otherwise, the location of the duplicate samplers should be determined randomly, if possible.

11.1.2 Other types of Quality Control samples should be collected or created at the direction of the project Quality Assurance or Management Staff. This includes blanks, or samples that are specially generated for laboratory evaluation such as spiked samples and blind or double blind samples.

11.1.3 Quality control samples are collected using separate SCFs. Annotate the SCF of both the original sample and the QC sample to identify the sample number of the associated sample.

11.1.4 All data related to where the sample was collected, how it was collected, and how it was preserved is essential and must be accurately recorded.

11.2 Records Management

11.2.1 Chain-of-Custody will be maintained at all times on collected samples until samples are submitted to the Laboratory. Field team custody will typically end with transfer to Sample Control.

11.2.2 All original Sample Control Forms must be kept with the sample for submission to the Laboratory.

11.2.3 Copies/duplicates of the sample forms are to be delivered with the samples to Sample Control. Other documents generated by the field team are also to be delivered to sample control for archive.

11.2.4 Sample Control will be responsible for delivery of documents generated by field teams to the appropriate documentation unit of the incident management organization or team. The documentation unit will have the responsibility for final disposition, archive, or distribution of all sample related documentation.

11.2.5 Field teams shall have access to copies of forms and records that have been submitted to Sample Control, upon request.

11.2.6 Field Teams shall maintain a Field Logbook, recording information related to the team's monitoring and sampling activities. Copies of logbook entries will be submitted to the documentation unit for reference and validation of sample data. Field Teams will be responsible for maintaining the logbook, which will be submitted for archive at the end of the event or activity, or when the logbook is filled.

11.3 Data Verification

11.3.1 Field teams are responsible for review all sample documentation prior to submission of samples to Sample Control. Ensure that all Sample Control Forms and Chain-of-Custody forms are complete and correct and that exposure rate and contamination control information is entered in the proper location on the SCF.

11.3.2 Field teams are responsible for assuring that samples are properly packaged and all of the appropriate labels are attached and are consistent with the SCF for each sample.

11.3.3 Further review of data for completeness, comparability, representativeness and accuracy will be performed at all stages of sample handling, with final reviews performed by FRMAC Assessment Group or the ICS Planning Section or Environmental Unit that is responsible for the data validation process.

11.4 Computer Hardware and Software Management

There are no specific requirements in place for the management of computer hardware or software associated with environmental sampling at the time of this writing. Some federal organizations are in the process of transition to computer based documentation for recording data and will require management processes to be defined when the programs are established.

11.5 Procurement Requirements

Special procurements will only apply to reagents used for preservation of samples when required. All special reagents will be obtained through the sample preparation facility where procurement requirements for laboratory reagents have been met.

11.6 Assessments

This SOP shall be reviewed for technical content and revised as needed every two calendar years following the requirements in SOP RIE-101. The review process shall include the CERMER and CRQA Directors and the QAC in addition to at least one qualified technical reviewer.

11.7 Nonconformance and Corrective Actions

If a procedural non-conformance is discovered or one occurs due to unforeseen circumstances, the non-conformance issue must be documented using Form RIE101-003F, "R&IE Quality Action Report." Follow the process for disposition and resolution of the corrective action as described on the back of the form and also in SOP R&IE-101.

12.0 DATA ANALYSIS AND CALCULATION

N/A

13.0 DATA REVIEW

N/A

14.0 METHOD PERFORMANCE

Field team sample collection effectiveness will be evaluated through the analysis of field and laboratory duplicates for representativeness, and repeatability. The Monitoring Division, and/or Environmental Unit in conjunction with Incident Management and Assessment teams will determine whether or not specific samples meet the minimum requirements for use.

15.0 ENVIRONMENTAL MANAGEMENT SYSTEM

15.1 Pollution Prevention

Field teams will not dispose of or abandon used sampling equipment in the field, including any items that may become contaminated through routine usage, or any preservatives or empty containers for storage or transport of chemicals used for preservation of samples.

15.2 Waste Management

All waste materials generated in the field will be segregated and disposed of at the contamination control line upon return of the field team to the support facilities according to the appropriate hotline protocol and procedures.

16.0 REFERENCES

16.1 Specifications and Requirements

16.1.1 Office of Radiation and Indoor Air / Radiation and Indoor Environments National Laboratory Quality Management Plan, Rev. 2, 2006

16.1.2 SOP CER-803, Sampling Equipment Decontamination (Draft), Center for Environmental Remediation, Monitoring, and Emergency Response (CERMER), Jan2011

16.1.3 SOP CER-205, Operation of Air Samplers without Flow Measurement Capability, Center

for Environmental Remediation, Monitoring, and Emergency Response (CERMER), Mar2011

16.1.4 SOP CER-206, Operation of the DL-28B Low Volume Air Sampler (Draft), Center for Environmental Remediation, Monitoring, and Emergency Response (CERMER, Draft)

16.1.5 SOP CER-207, Operation of the DH-504/804 High Volume Air Sampler (Draft), Center for Environmental Remediation, Monitoring, and Emergency Response (CERMER, Draft)

16.2 Guidance Documents or other special references

16.2.1 Radiation Monitoring and Sampling, Federal Radiological Monitoring and Assessment Center (FRMAC) Monitoring and Sampling Manual, Volume 2, February 2010.

16.2.2 Material Safety Data Sheets for Nitric and Hydrochloric Acid and Formaldehyde

16.2.3 SOP RIE-101, "Standard Operating Procedure Development", Rev. 5, 2009

17.0 APPENDICES

17.1 Diagram, Soil Sampling Frame

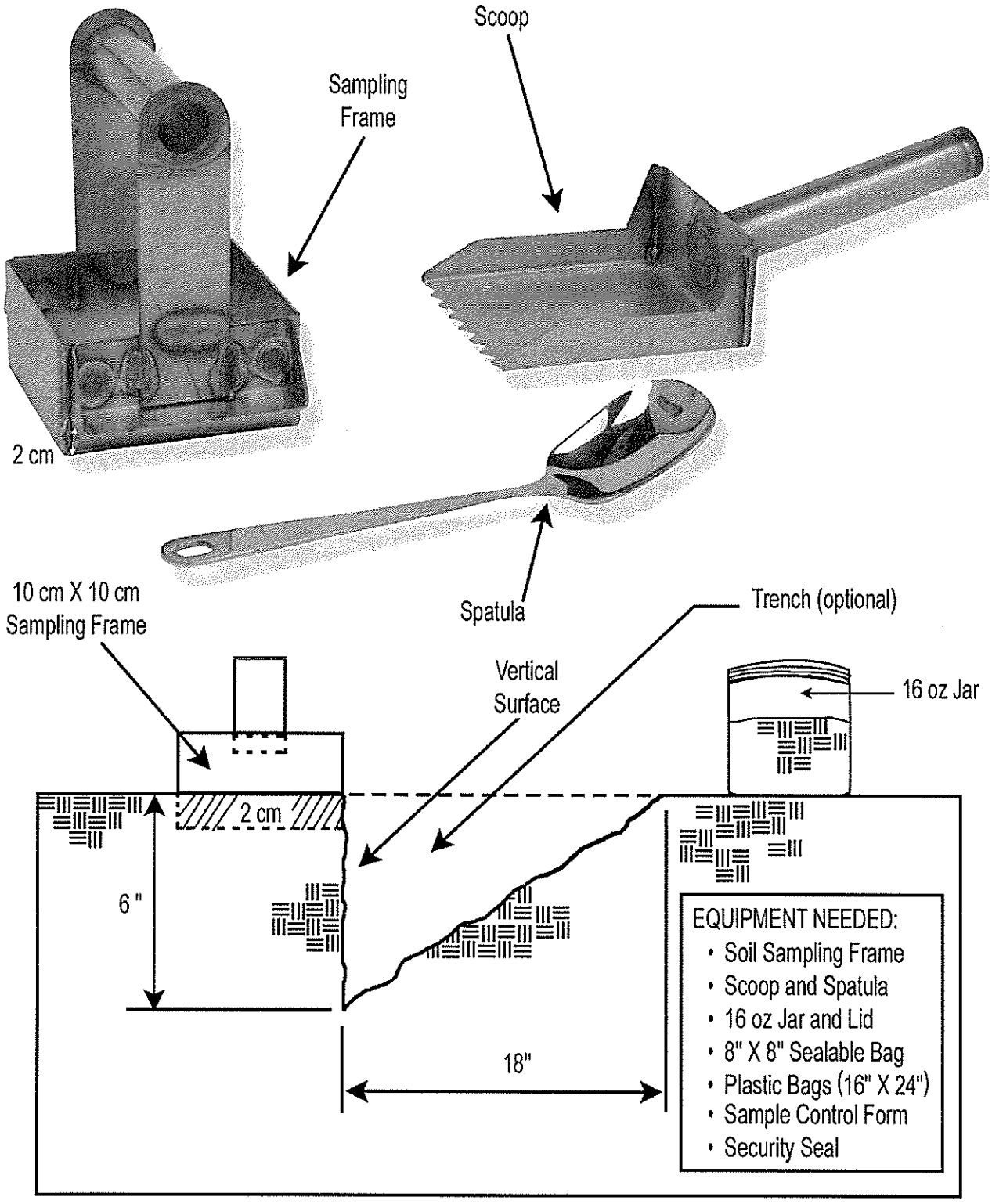
17.2 Example, Field Monitoring Log Form (FRMAC)

17.3 Example, Sample Control Form (RERT)

17.4 Example, Sample Control Form (FRMAC)

17.5 Example, Chain-of-Custody Form

Attachment 17.1 Diagram, soil sampling frame



Attachment 17.2 Example, Field Monitoring Log Form (FRMAC)

FIELD MONITORING LOG

(1) Team Number: _____ Date(MM/DD/YYYY): _____
Monitor's Names: _____ Reviewed By: _____

Instr ID:	Instrument and Probe Model & Type:	Entry & Exit QC checks: _____ (initial on return) QC Check Logbook Page #:	GPS Information (if used) Instrument ID: Manufacturer / Model: Deployment Site QA/QC checks: Site: Lat: _____ Long: _____
Instr ID:	Instrument and Probe Model & Type:	Entry & Exit QC checks: _____ (initial on return) QC Check Logbook Page #:	
Instr ID:	Instrument and Probe Mode & Type:	Entry & Exit QC checks: _____ (initial on return) QC Check Logbook Page #:	Remarks: Include ALL pertinent measurement factors. Environmental: Ground Conditions, mist, rain, etc. If samples are collected at this site; Note Sample ID and type here (11)

	Time (Military) (2)	Location Description (Location/Flag ID if used) Attach map/drawing if necessary (3)	Latitude (4)	Longitude (5)	Inst ID (6)	Measurement (7)	Units (8)	Radiation Type / Energy(9)	Measure-ment Surface (10)	
(A)										
(B)										
(C)										
(D)										
(E)										
(F)										
(G)										
(H)										
(I)										

Original to Data Center **Copy to Field Monitoring** **July 2002**

Attachment 17.3 Example, Sample Control Form (RERT)

SAMPLE CONTROL FORM

Sample Control #

Collection Team #:	Collector's Name:		Home Org:
Location Description:			
Latitude:		Longitude:	
SAMPLE TYPE:			
Air Samples	Sampler Type:		Filter Size & Type:
	Date **ON**:		Time **ON** (Military):
	Date **OFF**:		Time **OFF** (Military):
	Start Flow (Corrected):		Stop Flow (Corrected):
Milk Samples	Cow ☐ Goat ☐	Stored Feed ☐ Pasture ☐	Other:
	Milking Date:		Milking Time (Military):
Soil Samples	Area of sample: (cm) x (cm)		Depth of sample: (cm)
	Was vegetation collected with soil sample? Yes ☐ No ☐		
	If Yes, vegetation Sample Control #:		
Water Samples	Surface ☐ Ground/Well ☐	Potable/Tap ☐	Other:
Other Samples	Vegetation ☐ Feed ☐	Produce ☐	Other:
	Describe:		

This Section applies to **ALL** samples			
Collection Date:		Collection Time (Military):	
Total Sample Size (Estimated):		Number of Containers:	
Contact RAD Level:	Units:	Instrument #:	Inst. Type:

Remarks: _____

QC Sample #:

Shaded Sections for Sample Preparation & Control Use Only	QA Type:								
Laboratory:	γ	$\alpha\beta$	Sr	Pu	H^3	Other	Other	Other	Other

Contamination Check ☐ Sample Control Initial: Validated By:

Sample Control & Sample Preparation Comments: _____

4135R&IE09 Revision Date November 2008

Original with Sample **Yellow Copy to Data Control** **Pink Copy to Sample Control**

Attachment 17.4 Example, Sample Control Form (FRMAC)

SAMPLE CONTROL FORM & CHAIN OF CUSTODY | *"Sample Control Barcode"*

Collection Team ID: Collector's Name: Org:

Location ☐ GPS Latitude: _____ Description: _____

Longitude: _____

Collection Date: Collection Time (Military): # of Containers Contact Dose Rate:

Remarks: _____

Air
Sampler ID # Type: Filter size & Type:
Date ON: Time ON: Date OFF: Time OFF:
Start Flow: Stop Flow: **OR** Total Volume: Unit:

Milk
☐ Cow ☐ Goat ☐ Other _____ | ☐ Stored Feed ☐ Pasture ☐ Other _____
Milking Date: Milking Time: Number of Animals sampled:

Ground
Depth of soil sample: cm | Vegetation collected with soil samples? ☐ Yes ☐ No
Sample surface area: | If vegetation in separate container, provide sample #:

Water ☐ Surface ☐ Ground / Well ☐ Portable / Tap ☐ Other:

Other ☐ Vegetation ☐ Feed ☐ Produce ☐ Swipe ☐ Other:
Describe:

Sample Receiving ***(to be filled out by sample receiving technician)***

Processing Priority: Dup Sample #: Split Sample #:

Screening Value: ☐ **Contamination Check:** Forms and sample bags surveyed.

Sample Remarks:

Analysis Requested: ☐ **Sample Preparation Required,** send to sample preparation area before laboratory

Laboratory Assignment:

Special Instructions:

Custody Transfer (Signatures)

Relinquished By:	Date	Time	Received By:	Date	Time
Relinquished By:	Date	Time	Received By:	Date	Time
Relinquished By:	Date	Time	Received By:	Date	Time
Relinquished By:	Date	Time	Received By:	Date	Time

Original with Sample **Copy to Data Center** **Copy to Courier** **September 2002**

Attachment 17.5 Example, Chain-of-Custody Form

ENVIRONMENTAL PROTECTION AGENCY
Office of Radiation and Indoor Air

RADIATION AND INDOOR ENVIRONMENTS NATIONAL LABORATORY
P.O. Box 98517
Las Vegas, Nevada 89193-8571

CHAIN OF CUSTODY RECORD

8517

PROJECT NO.	PROJECT NAME
SAMPLERS: *(Signature)*	

STA. NO.	DATE	TIME	COMP	GRAB	STATION LOCATION	NO. OF CONTAINERS							REMARKS

Relinquished by: *(Signature)*	Date	Time	Received by: *(Signature)*	Relinquished by: *(Signature)*	Date	Time	Received by: *(Signature)*
Relinquished by: *(Signature)*	Date	Time	Received by: *(Signature)*	Relinquished by: *(Signature)*	Date	Time	Received by: *(Signature)*
Relinquished by: *(Signature)*	Date	Time	Received for Lab. by: *(Signature)*	Date	Time	Remarks:	

Distribution: Original Accompanies Shipment; Copy to Coordinator Field Files

52752

U.S. GPO: 1993—770-251

210RIA/E06.6m